Education Under the Microscope
How competitive is Australia?
In the 21st century, where is Australia positioned in comparison to the rest of the world with regard to ICT in education?

By Associate Professor Glenn Finger
It is no longer adequate to operate in isolation! The global financial crisis has underlined this statement and recent government interrogation of economic policy and strategy has foregrounded the difference, for example, between monetary policy and fiscal policy, and between macro and micro economics.

The clear message has been that we are part of an open, globalized economy, and indeed a globalized knowledge economy.

Education can no longer be seen as closed, privatized practice, with clearly marked boundaries such as classrooms, schools, regions, states or, even, the nation. The Horizon Report 2009 (Johnson, Levine, & Smith, 2009) emphasises that a key trend is that, "Increasing globalization continues to affect the way we work, collaborate, and communicate.", and, "Increasingly, those who use technology in ways that expand their global connections are more likely to advance, while those who do not will find themselves on the sidelines".

This article explores the question – where is Australia positioned in comparison to the rest of the world? – and proposes a 2009 Report Card for Australia.

Caution and Context
Caution is always needed in making any international comparisons. As Simon Marginson (2007) appropriately notes, "National education systems, even individual institutions, are sociologically complex with distinct histories, economies, languages, cultures, programs, qualification structures, and professional traditions". The Organisation for Economic Cooperation and Development (OECD) publication – Education at a Glance 2009: OECD Indicators (OECD, 2009) provides international comparative data. For example, one measure is how a country prioritizes education in relation to its allocation of resources through expenditure on educational institutions as a percentage of...
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GDP, with Australia being ranked 16th on the key indicator. It is this kind of ranking which makes policymakers take notice, but we need to be more fine-grained to look at the ICT comparisons.

The context can be understood by examining the international trends. For example, in the OECD report *Trends Shaping Education* (OECD, 2008) 26 major current trends in education were identified, and grouped according to nine broad themes: ageing, global challenges, the new economic landscape, work and jobs, the learning society, ICT, citizenship and the state, social connections and values, and sustainable affluence. Those trends are obviously interconnected, but the main trends in relation to ICT were the digital revolution, increasing investments in education in technologies, and global education patterns. For identifying international trends, recommended reading is the Horizon Report series (www.nmc.org/publications), which uses three adoption horizon timeframes for the entrance of technologies into mainstream use for teaching, learning, research or creative applications; namely, “The first adoption horizon assumes the likelihood of entry into the mainstream of institutions within the next year; the second, within two to three years; and the third, within four to five years” (Johnson, Levine, & Smith, 2009, p. 3).

The Horizon Report 2009 (Johnson, Levine, & Smith, 2009) identified the following digital technologies for each of those adoption horizons:

- First adoption horizon – mobiles and cloud computing.
- Second adoption horizon – geo-everything and the personal web.
- Third adoption horizon – semantic-aware applications and smart objects.

In launching the Horizon Report 2009 Australia-New Zealand Edition (Johnson, Levine, Smith, Smythe, & Stone, 2009) in Brisbane in September 2009, Larry Johnson, CEO of The New Media Consortium, proposed that 'metatrends' were evident from his analysis of the series of Horizon Report issues, with the biggest metatrends being that, “The People are the network” and that “The network is everywhere”, enabling the further metatrends of collective intelligence, and content being co-created and is also everywhere.

The trends provide a useful context within which to develop the 2009 Report Card for Australia. That is, are school systems and schools embracing a networked world, and new forms of accessing, managing, sharing, and creating content? Are the technologies available now – mobile technologies and cloud computing – being used effectively for learning? Is collective intelligence, and co-creation of content being strategically considered?

**Proposing a 2009 Report Card for Australia**

David and Margaret bring considerable experience and expertise to inform their 'star' assessments in 'At the Movies' each week on ABC television – but they often disagree! Similarly, you might challenge the following 'star' assessments the author has made in presenting his Report Card for Australia in relation to the use of digital technologies in 21st century learning and teaching in Australia.
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Leadership and Management – ★★★★★
All Australian States and Territories have made significant advances in policy development, leadership and vision. The Digital Education Revolution is providing $2.2 billion over six years and has the potential to significantly influence all categories on the report card. Policy development and collaboration at the national level has been commendable. For example, the Ministerial Council for Education, Early Childhood Development and Youth Affairs (MCEETYA) (www.mceetya.edu.au/mceetya/), and the Australian Information and Communications Technology in Education Committee (AICTEC) (www.aictec.edu.au/) are excellent examples of strategic and collaborative thought leaders.

At the school level, there are understandings of the importance of leadership and vision, accountability, and digital futures. However, this is somewhat fragmented and innovative examples tend to be driven by dynamic leaders. Internationally, Australia compares favourably, though the Digital Education Revolution vision needs to be realised for Australia’s education system to become world class.

Curriculum – ★★★★★
Teachers in Australia lack the clarity which is usually provided through a national curriculum. Other countries of similar and larger populations have had this for some time, and have been able to transform their economies through early understanding of the global knowledge economy. To illustrate, countries such as South Korea, Singapore, and Taiwan are producers of value added smart technologies. Asian countries such as these are leaders in robotics and mechatronics, achieved largely through designing smart curriculum. Curriculum developments in Australia now incorporate the implications of 21st century digital technologies. The recently established Australian Curriculum, Assessment and Reporting Authority (ACARA) has the potential to improve our international standing through the development of a national curriculum. Its brief requires the development of continua for literacy and numeracy skills and ICT to be a foundation of the curriculum – see www.acara.edu.au.

Learning and Teaching – ★★★★★
This is where it matters most, and schools are still continuing to move towards becoming 21st century digital schools (Gaffney, 2009). Teacher confidence in using digital technologies is not uniformly strong. Research has indicated that teachers use a limited range of applications in largely traditional ways. Interactive whiteboard uptake lags countries such as the UK. The vision is being achieved earlier in other OECD countries and surpasses what occurs for many Australian school students.

While there are early adopters and pathfinders, use of new and emerging technologies is not ubiquitous. The OECD Program for International Student Assessment (PISA) 2006 data reported that only 23 percent (OECD average six percent) of 15 year old Australian students surveyed used a computer at school almost everyday, while 74 percent (OECD average 57 percent) of Australian students surveyed used a computer at home everyday. While these results are higher than the OECD average, the data do not reflect a compelling story of digital technology use in schools, and Australia is not a leader on these indicators.

There are challenges here for professional development, which are discussed later. In preparing future generations of teachers, while there are some excellent pre-service teacher education programs informed by international research, most programs are still designed using Shulman’s (1987) Pedagogical Content Knowledge (PCK), which was developed in 1986-87 BG (before Google).

No Australian teacher education program has yet to embrace the international developments related to Technological Pedagogical Content Knowledge, referred to as TPACK (www.tpack.org) (Misra & Koehler,) – the total package for teaching in the 21st century. TPACK is only beginning to be understood in Australia, and is not yet as evident as it is internationally. For example, this has been the subject of research and conceptualization in the US for several years. The AICTEC Advisory Group – Teaching for the Digital Age Advisory Group (TDAAG) endorsed by AICTEC in March 2009 is a step in the right direction and holds potential for improving the professional development of teachers.

Assessment – ★★★★★
Australian schools have been extremely slow to implement widespread assessment reform using digital technologies. The positive movement is that Australia is a joint partner, along with Finland, Portugal, Singapore and Britain as global partners in the Assessment and Teaching of 21st Century Skills (ATC21S) (www.atc21s.org/purpose-of-project/). As the intention is to link the project to the OECD, this holds promise for progressing the assessment agenda. The National Assessment Program: Information and Communication Technology Literacy is worthy of mention, though an analysis of results suggest that students use ICT in a relatively limited way, for example, communication with peers and using the Internet to look up information are frequent applications but there is much less frequent use of applications that involve creating, analysing or transforming information (www.mceetya.edu.au/mceetya/map_ict_literacy,12183.html).

Exploration of new digital technologies for eAssessment and eReporting seem to be similar to several other international investigations, though these have progressed more in some international settings.

Professional Development – ★★★★★
Some effective continuing professional development models are evident, particularly through professional associations such as the Australian Council for Computers in Education and its state chapters, formal university postgraduate programs, and the
use of online communities of interest, and communities of practice, such as Education Network Australia (EDNA, see www.edna.edu.au/edna/go). Some jurisdictions have developed standards for teachers; for example, Queensland College of Teachers Professional Standards (www.qct.edu.au/standards/index.html), which has expectations for the use of ICT and digital pedagogies. Unlike other countries, such as the US with the ISTE Standards, Australia still lacks a coherent, national set of standards.

**Extending Opportunities for Learning**

Many schools and teachers are still becoming digital schools (Gaffney, 2009). Few have moved beyond the traditional conception of a place called school defined by physical buildings and timetables. The next phase – networked school communities – which reflects Larry Johnson’s metatrends, are being explored by some pathfinders, characterized generally through understandings of student digital technology use in their personal lives and understanding of the importance and potential of learning in the home. The UK’s Home Access program, discussed in Vanessa Pittard’s article on page 28, (www.becta.org.uk/homeaccess) surpasses Australian developments at this stage. Student and home technologies, such as mobile technologies, are being banned by many schools. Internet filtering approaches is not a legislative priority in countries such as Denmark, Sweden and the Netherlands, where the focus is on learning. Australia could learn from those countries, rather than adopt a control and coercive, micromanagement approach to student digital technology use. Digital citizenship, in the ISTE Standards for both Teachers and Students in the US, is only recently becoming part of the conversation in Australia.

**Resources**

Some might challenge the four star rating here, but the author believes that schools have become increasingly well resourced, and this is likely to continue to improve, particularly with the national broadband network being promised. Student access to digital technologies in the home needs to be included, even though many schools have
yet to understand how this rich provision can be capitalized upon for learning. The uptake on new technologies by Australians is comparatively high. My provocative comment is that where meaningful use of digital technologies is not occurring, it is more a problem of a lack of resourcefulness, rather than a lack of resources. The resources available to teachers and students have never been better through increased provision and access by teachers and students evident in Australia. Provision through the Federal Government’s Digital Education Revolution, through improved provision by education systems (including some providing laptops for teachers), and digital technologies becoming more affordable, 1:1 computing is becoming more common. School infrastructure has improved, with many incorporating learning management systems, and interoperability has improved over time.

**Impact on Pupil Outcomes**

To make this assessment, we need to examine comparative data. There are examples available such as Trends in International Mathematics and Science Study (TIMSS) (see www.acer.edu.au/timss/) and PISA data (see www.pisa.oecd.org). While it is difficult to make any direct links between digital technologies and Australia’s performance, these data sets are important in making comparative judgements about student outcomes. It is also difficult to make assessments of performance within Australia as differences occur between and within the jurisdictions. Similarly, indigenous students continue to perform significantly lower than non-indigenous students. Extreme care is needed and it is important to disaggregate the data.

However, on the TIMSS (2007) data, internationally, Asian nations lead the way. Year 4 Australian students performed above the international TIMSS scale average in both mathematics and science, while Year 8 Australian students performed above the international scale average for science and were on par with the international scale average for mathematics. As ACER Chief Executive Geoff Masters summed up,

> “These results show that, overall, Australia is doing a very good job at educating students to an average standard... However, we need to ask ourselves, in an increasingly competitive global economy, is average good enough?”

Perhaps, I should have given Australia 2.5 stars.

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According to PISA 2006 data, derived from 400,000 students in 57 different countries, the top performing countries in science were Finland, followed by Canada, Japan, New Zealand, Hong Kong-China, Chinese Taipei, and Estonia. Australia, along with countries such as the Netherlands, Korea, Germany, the United Kingdom, and the Czech Republic scored above the OECD average (see - www.oecd.org/dataoecd/15/13/39725224.pdf).

The expenditure on digital technologies, the considerable energies being provided in professional development, and the Digital Education Revolution vision for teaching and learning in Australia in the 21st century ultimately needs to impact on pupil outcomes. In an international context, we are yet to be consistently ranked in the select group of top performing countries.

Concluding Message – Can Do Better
The key message is that, when benchmarked against where we started in the 1980s when PCs first appeared in schools, and we progressed to the Internet revolution in the mid-1990s, and have been immersed in an increasingly, networked globalized knowledge economy enabled by digital technologies, progress has been made within Australian educational institutions. You might consider the author to be a hard marker, but, when compared with the international path finding countries, there is no room for complacency, and the general comment is that which many students find on their report cards – Australia has made some progress, but overall can do better!

How would you rate Australia’s education system? What do you think our report card should be in the next 12-24 months? In five years? By 2020?

Summary – A Report Card for Australia

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<td>Impact on pupil outcomes</td>
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A full list of references is available on request from editorial@australianmediagroup.com.

Associate Glenn Finger is Deputy Dean (Learning and Teaching) in the Faculty of Education at Griffith University, Queensland. This portfolio involves responsibilities which reflect his passion – learning and teaching – and he loves teaching the teachers. For his outstanding teaching, he has won various teaching awards and citations, including the 2008 Australian Teacher Education Association Pearson Education Teacher Educator of the Year, and an Australian Learning and Teaching Citation for Outstanding Contribution to Student Learning. Visit Glenn's Professional Page at http://www.griffith.edu.au/professional-page/glenn-finger or email Glenn at G.Finger@griffith.edu.au.

We would love to hear your comments and thoughts on this issue’s cover story. Do you agree with Associate Professor Glenn Finger’s rating of Australian education? Please email us at editorial@australianmediagroup.com with your opinion.

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